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Federal Reserve Bank of Cleveland

Inflation, Inflation Expectations, and Monetary Policy

by Sandra Pianalto

The Federal Open Market Committee, or FOMC, decided to keep the federal funds rate target unchanged at its last meeting on August 8. Although I cannot speak for any of my colleagues on the Committee, two factors were behind my decision to support a pause at that meeting.

First, while the elevated inflation numbers concerned me, and indeed they still do, the overall pace of economic activity—especially housing activity—had begun to moderate, and the full effect of the FOMC's previous rate increases had not yet been felt. I viewed a pause as appropriate because I wanted the chance to accumulate more information before judging whether additional policy firming would be needed.

Another important element in my thinking was the stability of inflation expectations. I will quote directly from the minutes of the August 8 meeting here: "Following 17 consecutive policy firming actions, members generally saw limited risk in deferring further policy tightening that might prove necessary, as long as inflation expectations remained contained."

Why should inflation expectations matter so much to the FOMC? Congress has mandated that the Federal Reserve control inflation, of course, but also that it promote maximum sustainable growth. And it so happens that when inflation expectations are managed well—specifically, when they are *anchored*, the central bank—the Federal Reserve—can best promote sustainable economic growth.

■ The Difference between Inflation and a Relative Price Increase

Let me begin by making a crucial distinction between inflation and a relative price increase. People often see price increases in some of the items they buy and assume that a period of inflation has begun. However, inflation is a condition that affects all prices, not just the price of particular goods or services.

Consider copper prices. As of yesterday, copper prices were roughly seven times higher than they were in 1965. I might conclude that the cost of obtaining copper is now seven times higher than it was 40-some years ago. But we all know that's not true.

The truth is that, despite large swings up and down, the relative price of copper—that is, its price relative to the average of all prices, based on the Consumer Price Index—tended to fall for much of the period from the mid-1970s through 2001. Over the past several years, the relative price of copper has shot up, of course, but even with this sharp increase, the relative price is nowhere near seven times its 1965 level.

Copper prices have not risen that much more than all prices, on average. The fact is that all prices, on average, have risen fivefold in the past 40 years. This fivefold increase in all prices is inflation.

A relative price increase is quite different from inflation. Changes in relative prices reflect changes in the supply and demand conditions of specific markets. Inflation reflects something else altogether.

Careful readers of FOMC communications will note that in addition to talking about actual inflation, the committee often talks about inflation expectations. Sandra Pianalto, the president and chief executive officer of the Federal Reserve Bank of Cleveland, explains the important role that inflation expectations play in the monetary policy process. This *Commentary* is taken from a speech she delivered to the Copper Development Association's Global Market Trends Conference on September 8, 2006.

It's true that the two are not always so easy to tell apart. Sometimes, we experience such a large and persistent relative price change that it temporarily ripples through the inflation data. The obvious example is energy prices.

Today, energy prices are greatly increasing the costs faced by virtually every business and household in our country. Purchasing the same amount of gasoline or heating oil as we did a couple of years ago requires us either to earn more, save less, or purchase fewer nonenergy items. Adjusting to higher energy prices requires us to make real sacrifices. The Federal Reserve cannot offset these costs because we do not create oil.

Nevertheless, the Federal Reserve can control inflation over the medium to longer term. While we can't increase the supply of oil, we do control the supply of money. And that means we control

the average price level over time. To paraphrase a famous economist, Irving Fisher, the average price level doesn't rise because of the goods; it rises because of the money. If growth in money exceeds its demand, its purchasing power will depreciate. This is inflation. It affects all prices and wages, and ultimately it has only one origin, the central bank. The central bank is solely responsible for managing the nation's money supply.

Appreciating the distinction between inflation and a relative price increase helps one understand the need for measures of "core" inflation, like the core CPI or the core PCE (personal consumption expenditures). Core inflation measures attempt to strip away the most volatile relative price movements—like food and energy—which may temporarily cause an aggregate price measure to fluctuate in a way that does not reflect a persistent change in the purchasing power of money. Measures of core inflation are useful metrics for the central bank, and perhaps only the central bank, to monitor.

I think most people recognize the importance of allowing individual prices to move up and down relative to one another. At the same time, I think that most people would agree that allowing the value of our money to depreciate over time is bad for economic prosperity. But just what is it about inflation that is so costly? Well, it turns out that the lasting harm to our economy comes when a sustained period of inflation changes inflation expectations.

■ **Why Anchoring Inflation Expectations Is Important to Prosperity**

Back in 1968, Milton Friedman warned economists and policymakers not to try to stimulate economic growth at the cost of "just a little more" inflation. He predicted that people would come to anticipate that little bit of extra inflation and then would change their behavior in various ways. If policymakers still expected people to behave as they had in the past, they would attempt to do things that were no longer possible. In effect, Friedman was warning policymakers not to treat inflation expectations as a static concept, but to appreciate the interdependence of inflation and inflation expectations.

Unfortunately, the economic events of the 1970s bear out Friedman's warning. Households and businesses did adjust their behavior to minimize the costs they faced from rising inflation. And once inflation expectations became unglued, we watched with dismay as the costs arising from inflation expectations took a huge toll on our resources. The economy spiraled into "stagflation"—an environment of worsening economic performance and higher inflation.

Let's consider some of the ways that rising inflation expectations can hinder economic performance. For example, we know that people who fear higher inflation often choose to put their wealth into real assets, such as land, gold, silver, or copper. They do this not so much as a hedge against a rising price level. So as the expectation of inflation grows, these asset prices will likely reflect two things: the value of the asset in production and its value as an inflation hedge. This alters the flow of our scarce resources from their best use.

Of course, this is just one example of the damage that an inflationary psychology inflicts on our economy. When people begin to anticipate a decline in the purchasing power of their dollars, they will take many actions to protect themselves. They will use their time and wealth to try to minimize the amount of money they hold because that money is slowly losing its purchasing power. Inflation also raises the effective tax rate that people pay on income they earn from investing and saving. This, in turn, induces people to forgo investments and discourages them from saving.

Inflation also makes it difficult for borrowers and lenders, who now must evaluate the future purchasing power of money, not just the real terms of a contract. The costs associated with making these predictions rise with inflation because higher levels of inflation are generally more volatile and more difficult to predict. As inflation becomes more unpredictable, lenders demand insurance against this risk in the form of higher interest rates. This makes long-term contracts, particularly financial contracts, more costly than they would be if inflation weren't a concern.

People can also make costly mistakes as they try to distinguish between changes in relative prices and inflation. If infla-

tion is highly unpredictable, entrepreneurs may assume that all price changes are the result of the inflationary policies of the central bank and ignore some important relative price signals telling them to adjust their business plans.

All of the actions that people take to guard against inflation consume precious resources that would be used more productively in a world where people didn't have to worry about inflation. These are the costs that a central bank must keep in check if our economy is to achieve its full potential.

■ **The Measurement and Theory of Inflation Expectations**

Well, it's one thing to understand that you want to keep inflation expectations in check, but it is an entirely different matter knowing when, in fact, they are in check. Let me explain some of the ways we attempt to measure inflation expectations.

We can look for changes in inflationary sentiment in a variety of indicators. Asset markets give us some indirect measures. For example, we can track the price movements of any number of investment goods, such as metals and other commodities, or real estate, or any tangible asset that investors might see as a "safe haven" from inflation.

We can also monitor the behavior of long-term interest rates relative to short-term rates, otherwise known as "the yield curve." A steepening of the yield curve—that is, a rise in long-term rates relative to short-term rates—might signal that bond buyers are demanding some protection against inflation.

A relatively new and promising measure comes from comparing the yields on Treasury Inflation Indexed Securities, commonly known as TIPS, and regular Treasury securities. TIPS give an investor a fixed real return because the principal and interest payments are tied to the Consumer Price Index. Regular Treasury securities are not tied to the CPI, so we can look at the difference in the rates of return between the two securities to infer how much inflation investors might expect to see over different time horizons—for example, over the next 5 to 10 years. (Research at the Federal Reserve Bank of Cleveland suggests there is a risk premium in the TIPS market, which is likely to fluctuate and

complicate an accurate interpretation of the inflationary sentiment coming from financial markets. See “Expected Inflation and TIPS,” Federal Reserve Bank of Cleveland, *Economic Commentary*, 2005.)

The problem with financial market indicators is that asset prices respond to any number of risks, not just inflation. In a world that is always confronting and evaluating risks, disentangling the inflation risk from all the other risks is a very imperfect science. Nevertheless, financial market indicators are proving to be a useful yardstick for monitoring inflation expectations.

You might think that a better way to gauge inflation expectations would be to simply ask people their views on inflation. In fact, there is a survey that does just that. Once a month, the University of Michigan interviews about 500 households around the nation, asking people how much they think prices will rise in the next 12 months and over the next 5 to 10 years. Here, too, there are some problems with interpreting the raw data. For one thing, the beliefs of households about future inflation are typically much higher than the actual inflation rate.

Also, investigations into the survey data have revealed some fascinating patterns. For example, people are likely to report their inflation predictions in terms of whole numbers, and particular whole numbers at that. It turns out that people are far more likely to report that they expect 0, 3, or 5 percent inflation than 1, 2, or 4 percent.

Research at the Federal Reserve Bank of Cleveland also reveals sharply different perspectives on future inflation across demographic groups. Women, on average, tend to have higher inflation expectations than men, the poor higher than the rich, and the young and elderly higher than the middle-aged.

These patterns in the survey responses may be more than just an intellectual curiosity. When you get right down to it, we really know very little about how people form their inflation expectations. To what extent are expectations based on past inflation experience versus looking into the future? Do people scour all of the available data to predict inflation, or do they just consider the information most readily available to

them? And, perhaps most important, how do people act on the inflation expectations that we measure through the household surveys?

There is much at stake in the answers to these questions. We might discover important differences between household survey information and financial market data. We may also find an answer to one of the great questions—and obstacles—in the monetary policy process. Namely, are inflation expectations responsible for the long time it takes for monetary policy actions to show up in the inflation data?

Understanding what lies behind our measures of inflation expectations could greatly enhance the design and conduct of monetary policy. For example, it could help us understand what types of institutional arrangements and communication policies help the central bank retain credibility for meeting its price stability objective, even when large and persistent relative price changes ripple through the inflation data.

To that end, unlocking some of the mysteries about inflation expectations may help central banks decide whether, and how, to incorporate a numerical inflation objective into the monetary policy process. Some central banks have used these numerical objectives as a tool to help anchor inflation expectations.

Economists refer to a numerical inflation objective as a “commitment device,” that is, a means for holding a central bank’s feet to the fire. That may be so. But whether or not there is an explicit numerical objective, anchoring inflation expectations requires a central bank to keep inflation low and stable, to reinforce its commitment to price stability, and to clearly communicate its policies in pursuit of that commitment.

I welcome research that helps us learn about the strengths and weaknesses of various communication tools and strategies designed to keep inflation expectations firmly anchored. This is a research agenda and a discussion that is now under way in the Federal Reserve, and I am excited to be engaged in it.

■ Conclusion

I hope that I have given you a better understanding of why it is so important for the Federal Reserve to anchor inflation expectations. Inflation is what the Federal Reserve can control—not the

price of oil or copper or any other commodity. By anchoring the inflation expectations of households and businesses, we will help sustain the prosperity that generations of Americans have come to enjoy. And as we learn more about how inflation expectations are formed, we can do our job as monetary policymakers even better.

■ Recommended Reading

For a discussion of the difference between inflation and relative price increases:

Michael F. Bryan. 2002. “Is It More Expensive, Or Does It Just Cost More Money?” Federal Reserve Bank of Cleveland, *Economic Commentary* (May 15).

For a recent summary of the costs of inflation:

Richard G. Anderson. 2006. “Inflation’s Economic Cost: How Large? How Certain?” Federal Reserve Bank of St. Louis, *The Regional Economist* (July 2006).

For the source of Milton Friedman’s warning about inflation expectations:

Milton Friedman. 1968. “The Role of Monetary Policy,” *American Economic Review*, vol. 58, no. 1 (March), pp. 1–17.

On the curious patterns found in surveys of the public’s inflation expectations:

Michael F. Bryan, and Stefan Palmqvist. “Testing Near-Rationality Using Detailed Survey Data,” Federal Reserve Bank of Cleveland Working Paper, no. 05-02.

Michael F. Bryan, and Guhan Venkatu. 2001. “The Demographics of Inflation Opinion Surveys,” Federal Reserve Bank of Cleveland, *Economic Commentary* (October 15).

Michael F. Bryan, and Guhan Venkatu. 2001. “The Curiously Different Inflation Perspectives of Men and Women,” Federal Reserve Bank of Cleveland, *Economic Commentary* (November).

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On the ways the formation of inflation expectations may affect the conduct of the central bank:

Laurence N. Ball, Gregory Mankiw, and Ricardo Reis. 2005. "Monetary Policy for Inattentive Economies," *Journal of Monetary Economics*, vol. 52 (May).

Athanasios Orphanides, and John C. Williams. 2006. "Inflation Targeting under Imperfect Knowledge," Federal Reserve Bank of San Francisco Working Paper, no 2006-14.

For a discussion of monetary policy and the behavior of asset prices, including the pitfalls of policy based on the behavior of asset prices, I recommend:

Donald L. Kohn. 2006. "Monetary Policy and Asset Prices," a speech delivered at a European Central Bank Colloquium in honor of Otmar Issing (March 16).

It may be that the process by which inflation is transmitted to all prices begins with basic commodities. For some evidence that commodity prices tend to lead inflation at the retail level, see:

Fred Furlong, and Robert Ingenito, 1996. "Commodity Prices and Inflation," Federal Reserve Bank of San Francisco, *Economic Review* (no. 2).

On the link between monetary policy and the yield curve:

Ben Bernanke. 2006. "Reflections on the Yield Curve and Monetary Policy," a speech before the Economic Club of New York (March 20).

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The views expressed here are those of the author and not necessarily those of the Federal Reserve Bank of Cleveland, the Board of Governors of the Federal Reserve System, or its staff.

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